DATA SERVICES OPPORTUNITIES

INPUT

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TOTAL SERVICES OPPORTUNITIES

A Report for Digital Equipment Co. Limited

By INPUT LTD.

INPUT®

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Abstract

This document consists of a series of exhibits concerning the market size and total services opportunities in the United Kingdom. Each exhibit contains a page of narrative that highlights the major trends that arise out of the figures.

The expenditures shown are a result of INPUT research, and have been adapted to a Digital Equipment model of four main sectors: planning, development, management, and maintenance.

The major conclusions of the report are to clearly identify two major trends, the breaking down of traditional market boundaries, and the shift into services on the part of both equipment and software products vendors. The report also identifies the reasons for these trends.

The top vendors overall in the services market are shown as well as those in each of the four sectors of the market. Their revenues and contributions are also shown.

There is a competitive analysis of these vendors at the end of the document.

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I

Market Analysis

I

Market Analysis

A

Total User Expenditures—Western Europe

- Expenditure on information technology in Western Europe has quadrupled overall in the last ten years at an average compound growth rate of 14%.
- Although the systems market has experienced steady and continuous growth, the most dramatic growth areas have been software products and communications at a compound annual growth rate of over 30%.

EXHIBIT I-1

Western Europe

	Total User Expenditures					$ Billions		
	1979	%	1989	%	CAGR 79-89	1994	%	CAGR 89-94
Equipment	12.5	28	50	30	15	77	26	9
Software Products	0.9	2	17	10	34	42	14	20
Maintenance	3.5	8	13	8	14	18	6	7
Systems	5.5	13	26	16	17	57	20	17
Communications	0.4	1	7	4	33	17	6	19
People and Other	21.2	48	54	32	10	80	27	8
Total	44.0	100	167	100	14	291	100	12

- Projecting into the future, the maintenance and equipment markets will experience a relative decline against the software and services sector. From a share of total expenditure of 38% in 1989, equipment and maintenance is expected to shrink to less than a third of the total by 1994.

- France is the largest computer software and services market in Western Europe, representing 24% of the total market. The French market is very services oriented and tends to favour custom-built software rather than software products. A feature of the French market is the number of medium to large software and services companies, the "SSII".

- West Germany is the second largest country market with 19% of the total. The West German market tends to be much more product oriented than France and favours turnkey delivery of systems. West Germany does not have such a strong services market as France, and vendors tend to be either large or small. This fragmentation is accentuated by the federal structure of the country and the concentration of vertical sector markets in federal states.

- The United Kingdom represents just under 19% of the total Western European market and has a size similar to that of West Germany. The United Kingdom has a mixed profile between the services bias of France and the products bias of West Germany. The United Kingdom has the largest network services and systems integration markets. Another feature of the United Kingdom market is the strong penetration of foreign services vendors, especially from the United States.

- Other country markets of significant size are Italy, which represents just under 12% of the total, and The Netherlands, with a share of just over 5%. The remaining Western European market after these principal countries is approximately one-fifth of the total and is split in order of descending size between Sweden, Switzerland, Spain, Belgium, Denmark, Norway, Finland, Austria and the rest.

B

Total User Expenditures—United Kingdom

- The equipment sector is expected to further shrink to about one quarter of the total IT expenditure in the United Kingdom, from one-third approximately 10 years ago. This reduction is accompanied by a similar relative stagnation in the equipment maintenance market.

- Software products and communications have shown the most significant growth rates in the last ten years, and although growth is expected to continue, it will be at a slightly reduced rate.

- The recent high growth in systems services is expected to continue, becoming marginally the fastest growing sector of the market. This figure is for IS consultancy and software development, does not include business consultancy (which is evidently growing at least as fast as IS consultancy), and is becoming a more significant part of the business activity of the auditing companies than their original accountancy.

- Internal expenditure has reduced from nearly a half of total expenditure to less than one-third. This trend is expected to continue, but the shift to external services for systems development is expected to be counteracted to some extent by the increase in people costs.

EXHIBIT I-2

United Kingdom

	Total User Expenditures					$ Billions		
	1979	%	1989	%	CAGR 79-89	1994	%	CAGR 89-94
Equipment	2,000	31	6,200	29	12	9,400	25	9
Software Products	200	3	2,230	11	27	5,360	14	19
Maintenance	400	6	2,280	11	19	3,200	8	7
Systems	800	12	2,840	13	14	6,940	18	20
Communications	100	2	1,100	5	27	2,200	6	15
People and Other	3,000	46	6,480	31	8	10,690	28	11
Total	6,500	100	21,130	100	13	37,790	100	12

C

User Expenditures on External Services—United Kingdom

- The move towards expenditures on external services represents a major shift in spending on information technology; the total services market in the United Kingdom is expected to approximately double over the next five years.

- By 1994, maintenance services will have declined from approximately one-third of the total services market to approximately only one-fifth.

- The planning services market—which includes both business consultancy and IS consultancy—is expected to triple in size and equal the maintenance services market by 1994. Planning services is the highest growth sector of the services market at the moment.

- The figures for maintenance include expenditures on external software maintenance services.

- The figure for management services includes professional services in operations, processing, facilities management and consumables.

- Software development will become the largest part of the total expenditure on external services.

EXHIBIT I-3

United Kingdom

	External Services User Expenditures					$ Millions		
	1988	%	1989	%	Growth 88-89	1994	%	CAGR 89-94
Planning	880	12	1,110	13	26	3,360	19	25
Development	1,980	27	2,435	28	23	5,810	33	19
Management	2,140	29	2,620	30	22	4,890	28	13
Maintenance	2,430	33	2,570	29	6	3,485	20	6
Total	7,430	100	8,735	100	18	17,545	100	15

D

User Expenditures on External Services by Subsector—United Kingdom

- When comparing each subsector's growth in equipment and products, it is possible to see that a major shift into services is taking place. All the professional services subsectors demonstrate healthy growth.

- The reasons for this shift are:

  - The rate of technological change makes it very difficult for the end-user to maintain skills that are up to date; external specialist skills are required. In addition, new skills to meet the growing importance of new technologies such as networking are required.

  - The shortage of qualified staff and the high staff turnover relative to the mainstream business make buying-out a more economical solution than internal training and development.

  - The move away from the centralised mainframe towards departmental computing means that more end users have to make systems decisions—with a corresponding increase in the need for external assistance.

  - The nature of applications is changing away from clearly defined administration systems into information processing systems that are more open-ended and require greater functional and technical integration.

  - The shift towards new kinds of systems is being hampered by the in-house maintenance load to maintain the old ones. This implies opportunities for external vendors develop new systems, to take on software maintenance and to manage the existing facility.

- The greater sophistication of the end-user base with hands-on experience of micros, allied with the upgrading of systems to a strategic boardroom issue has exerted greater pressure on in-house resources and resulted in contracting of external help.

EXHIBIT I-4

United Kingdom

	External Services—User Expenditures					$ Millions		
	1988	%	1989	%	Growth 88-89	1994	%	CAGR 89-94
Business Consultancy	560	7.5	705	8.1	26	2,230	12.7	26
IS Consultancy	320	4.3	405	4.6	27	1,130	6.4	23
Software Development	1,980	26.6	2,435	27.9	23	5,810	33.1	19
IS Functional Mgt. Support	205	2.8	255	2.9	24	750	4.3	24
Site Levels Operations	15	0.2	25	0.3	67	75	0.4	25
Consumables	970	13.1	1,290	14.8	33	2,500	14.2	14
Processing	930	12.5	1,025	11.7	10	1,505	8.6	8
Other	20	0.3	25	0.3	25	60	0.3	19
Software Maintenance	240	3.2	290	3.3	21	715	4.1	20
Hardware Maintenance	2,190	29.5	2,280	26.1	4	2,770	15.8	4
Total	7,430	100	8,735	100	18	17,545	100	15

E

External Planning Services—United Kingdom

- As well as being one of the fastest growth areas, external planning services is also one of the most strategic areas for services vendors. The Big 6 accounting companies and management consultants have been using their consultancy skills as a lever to offer software development facilities as a natural extension of their businesses. In some cases—e.g., Andersen Consulting—software is becoming a major part of the business.

- Strategic consultancy, by its nature, determines the type of systems solutions that are required. Companies that provide only software development are finding that by losing influence over strategic decisions they are losing business opportunities.

- The implications for all services companies are that they need to develop strategic consultancy skills, and that they need a detailed knowledge of the business of the client in order to become successful.

EXHIBIT I-5

United Kingdom

	External Planning Services—User Expenditures					$ Millions		
	1988	%	1989	%	Growth 88-89	1994	%	CAGR 89-94
Business Consultancy	560	64	705	64	26	2,230	66	26
IS Consultancy	320	36	405	36	27	1,130	34	23
Total	880	100	1,110	100	26	3,360	100	19

F

External Software Development—United Kingdom

- As projects become larger and more complex, management skills have more of a premium. Management skills also have a greater margin than lower-level skills. Software developers are having to come to terms with this skills disparity and are tending to become niche suppliers by specialising in industry markets.

- Fixed-price contracts for large systems integration projects are potentially very profitable, but also a very high-risk business. Greater knowledge of the business means less of a risk in systems development and less probability that the project will go seriously wrong.

- The most significant growth sectors in industry markets are believed to be government and finance.

- The banks are entering a major competitive war in order to offer better front-office systems for their clients, and this war has had a beneficial impact not only on software and services companies, but also on manufacturers of fault-tolerant equipment such as Tandem.

- Many parts of the finance sector are expected to become the first pan-European markets as a result of the 1992 initiative. In the short term, 1992 will mean a boost to software and services opportunities, but typically any deregulation leads to an oversupply, as there will eventually be fewer clients and more systems coherence. Although finance is therefore a good market, late entrants are likely to suffer in the long term.

- There is pressure from central government for central and local government agencies to use external services. This pressure has created a number of opportunities for companies specialising in this industry market. If the EEC implements its deregulation of government procurement successfully, one has another positive stimulus to the market.

- A change of government and a different attitude to public spending could also have some effect in the United Kingdom. There is evidence of attitudinal changes to public spending in all political parties.

EXHIBIT I-6

United Kingdom

	External Software Development—User Expenditures					$ Millions		
	1988	%	1989	%	Growth 88-89	1994	%	CAGR 89-94
Manufacturing	574	29	706	29	23	1,685	29	19
Finance	376	19	511	21	36	1,279	22	20
Distribution	198	10	219	9	11	465	8	16
Government	238	12	292	12	23	814	14	23
Services	198	10	244	10	23	581	10	19
Other	396	20	463	19	17	988	17	16
Total	1,980	100	2,435	100	23	5,812	100	19

G

External Management and Operations—United Kingdom

- In the United States, outsourcing is the subject of fierce debate. In Europe the debate is less fierce, although in the United Kingdom it is becoming a topic of major interest.

- There is evidence that the management and operations market in general, and the facilities management market in particular, are becoming more complex. Many companies are using these services in a tactical way rather than in a strategic way, or purely in order to cut costs.

- There is a very large mix of different types of companies in this part of the marketplace: equipment vendors, software developers, consultancies and third-party maintenance companies.

- This part of the market will also develop into both horizontal and vertical niches, for example network management across industries or disaster recovery for banks. Also, the differences between different types of services will become less clear cut, so that, for example, facilities management could be part processing service for a specific application, and part trouble-shooting for the whole company network. Some vendors will adopt a total services strategy in order to leverage adjacent services—for example, site-level operations to lead to facilities management.

- Although not a market where the need for industry specialisation is obviously apparent, experience has shown, in processing services for example, that companies that offer very specific services (such as payroll or back-office processing for banks) have suffered much less from the impact of new technology and services than companies that offered general bureau or timesharing services.

EXHIBIT I-7

United Kingdom

	External Management and Operations—User Expenditures					$ Millions		
	1988	%	1989	%	Growth 88-89	1994	%	CAGR 89-94
IS Functional Mgt. Support	205	9.6	255	9.7	24	750	15.3	24
Site Level Operations	15	0.7	25	1.0	67	75	1.5	25
Consumables	790	36.9	1,070	40.8	35	1,750	35.8	10
Network Service	180	8.4	220	8.4	22	750	15.3	28
Processing Service	790	36.9	845	32.3	7	1,015	20.8	4
Facilities Management	140	6.5	180	6.9	29	490	10.0	22
Other	20	.9	25	1.0	25	60	1.2	19
Total	2,140	100	2,620	100	22	4,890	100	13

H

External Maintenance—United Kingdom

- The emergence of CASE tools that allow reverse engineering may project software maintenance into a significant business opportunity. If a major shift from in-house maintenance occurs (allowing in-house resources to go for new developments), the projected growth rate of 20% could be conservative.

- Maintenance of third-party software presents an interesting concept, that of the "DP slum". As well as the opportunities for providing services that are leading-edge technology, there are other kinds of services. From an end-user point of view, existing systems in old hierarchical databases consisting of millions of lines of COBOL prevent the in-house staff from developing new systems. Contracting out the new systems contributes to the internal staff problems.

- The new concept might be then to take charge of the old systems for the client and maintain the software in existing production systems, while the client focuses software efforts on developing new systems, which is more motivational for the analysts and programmers on the in-house payroll. Although part of maintenance, this service is closely related to facilities management.

EXHIBIT I-8

United Kingdom

	External Maintenance Services—User Expenditures					$ Millions		
	1988	%	1989	%	Growth 88-89	1994	%	CAGR 89-94
Software Maintenance	240	10	290	11	21	715	20	20
Hardware Maintenance	2,190	90	2,280	89	4	2,770	80	4
Total	2,430	100	2,570	100	6	3,485	100	6

I

Total Expenditures on Internal and External Services (Including Business Consultancy)—United Kingdom

- A summary of the market in four main categories shows external services growing to approximately 44% of the total expenditure on information technology and consultancy.
- The total expenditure is projected to nearly double from 1989 and to reach $40 billion by 1994.

EXHIBIT I-9

United Kingdom

Category of Expenditure	Total Expenditure on Internal and External Services (Including Business Consultancy)				
	$ Millions 1989	Prop. %	CAGR % 89-94	$ Millions 1994	Prop. %
Equipment	6,200	28	9	9,400	23
Software (Products)	2,230	10	19	5,360	13
Salaries (No Overhead)	4,670	21	11	7,715	19
External Services	8,735	40	15	17,545	44
Total Expenditure	21,835	100	13	40,020	100

J

Internal User Expenditures, Salaries 1988—United Kingdom

- These salaries are the total salaries for people working in information technology in the United Kingdom. They exclude the salaries of people working for vendors.
- The figures contain the following assumptions concerning distribution of effort:

	Planning	Development (%)	Management (%)	Maintenance (%)
Management	30	10	50	10
Development		70		30
Data Prep.			90	10
Operations		20	60	20
Tech. Support		20	60	20
Other	25	25	25	25

- The proportions above are shown in the right corner of the boxes in Exhibit I-10.

EXHIBIT I-10

United Kingdom

Internal Expenditure—Salaries in 1988				$ Millions				
Function	Prop. %	Number	Median Salary £	Plan	Develop	Manage	Maintain	Total
Management	20	44,000	17,000	30 368	10 123	50 613	10 123	100 **1,227**
Development	34	74,800	12,000	0	70 1,030	0	30 441	100 **1,471**
Data Prep.	14	30,800	7,000	0	0	90 318	10 35	100 **353**
Operations	18	39,600	8,000	0	20 52	60 441	20 260	100 **753**
Tech. Support	5	11,000	13,000	0	20 47	60 141	20 47	100 **235**
Other	9	19,800	10,000	25 81	25 81	25 81	25 81	100 **324**
Total	100	220,000		10 449	30 1,333	37 1,594	23 987	100 **4,363**

K

Internal User Expenditures, Salaries 1994—United Kingdom

- In order to produce these numbers for 1994, assumptions on growth in salaries over 5 years have been made as follows:

Management	14%
Development	10%
Data Prep.	8%
Operations	8%
Tech. Support	10%
Other	8%

EXHIBIT I-11

United Kingdom

Internal Expenditure—Salaries in 1994				$ Millions				
Function	Prop. %	Number	Median Salary £	Plan	Develop	Manage	Maintain	Total
Management	17	42,500	32,500	40 906	15 340	40 906	5 113	100 2,265
Development	37	92,500	19,000	0	80 2,305	0	20 576	100 2,881
Data Prep.	11	27,500	10,000	0	0	90 406	10 45	100 451
Operations	12	30,000	11,500	0	10 57	85 481	5 28	100 566
Tech. Support	8	20,000	21,000	5 34	35 241	55 379	5 34	100 688
Other	15	37,500	14,000	25 215	25 215	25 215	25 215	100 860
Total	100	250,000		15 1,155	41 3,158	31 2,387	13 1,011	100 7,711

- Assumptions have also been made of changes in the distribution of effort, compared to 1988, as follows:

	Planning %	Development (%)	Management (%)	Maintenance (%)
Management	+10	+5	-10	-5
Development		+10		-10
Data Prep.			0	0
Operations		-10	+15	-5
Tech. Support	+5	+15	-5	-15
Other	0	0	0	0

- These assumptions can of course be altered and the numbers in the model adapted accordingly.

L

Vendor Revenues—United Kingdom

- 3 of the top 5 European vendors are missing from the list:
  - Cap Gemini Sogeti—Strong everywhere in Europe except U.K.
  - Volmac—Strong in Benelux
  - Finsiel—Predominant in Italy

- The top 4 are equipment vendors, and these would still be in the top 20 even without their hardware maintenance revenues.

- Many of the equipment vendors are making strong efforts to move into software and services, especially services. Efforts are being made by all to break into the systems integration market as prime contractor. However, the culture change from equipment products to services is very significant and difficult.

- Software products vendors are also making strong efforts to move into services—for example, Oracle, which would be number 36 on this list, obtains about half its U.K. revenues from services.

- The long-term effect of 1992 is likely to favour companies that can support their clients all over Europe. For services companies, this favouring dictates the presence of nationals in each country. It interesting to note that U.S. companies, which are strongly represented in the list, tend to be practised at support throughout Europe.

- The right-hand column of the table shows the contribution of service revenues to the total revenues of the company. In the case of the Big 6 auditing companies, auditing revenues have not been counted as service revenues in order to assess the importance of consultancy to the total business.

EXHIBIT I-12

United Kingdom

Vendor Revenues 1988					$ Millions		
Rank/Company	Plan	Devt.	Mgt.	Maint.	**Total**	Share	Contr.
1 IBM	10	140	70	430	**650**	8.7	10
2 ICL	10	110	50	320	**490**	6.6	31
3 Digital	5	40	40	200	**285**	3.8	22
4 Unisys	5	40	20	130	**195**	2.6	34
5 Sema Group	25	120	9		**154**	2.1	76
6 Prime		10	20	90	**120**	1.6	30
7 Hoskyns	5	35	70		**110**	1.5	61
8 SD-Scicon	15	90	5		**110**	1.5	83
9 Granada			10	100	**110**	1.5	10
10 Bull	5	20	2	80	**107**	1.4	25
11 Andersen	50	45	5		**100**	1.3	65
12 Logica	10	80			**90**	1.2	90
13 Olivetti	5	20	4	60	**89**	1.2	22
14 Istel		45	40		**85**	1.1	65
15 Thorn		50	35		**85**	1.1	8
16 C & L	55	25			**80**	1.1	40
17 PA	45	30			**75**	1.0	82
18 Price Waterhouse	55	20			**75**	1.0	35
19 Ernst & Young	55	15			**70**	0.9	26
20 P-E	60	10			**70**	0.9	95
21 Centre-File		25	40		**65**	0.9	64
22 KPMG	55	10			**65**	0.9	22
23 Data Logic		60			**60**	0.8	75
24 EDS		20	30		**50**	0.7	92
25 Computer People		45			**45**	0.6	100
26 CMG		40	2		**42**	0.6	64
27 Deloitte	35	5			**40**	0.5	23
28 McKinsey	35				**35**	0.5	82
29 Touche Ross	30	5			**35**	0.5	31
30 BIS		30			**30**	0.4	40
31 F Group	3	25			**28**	0.4	100
32 Bain	25				**25**	0.3	73
33 McDonnell Douglas		25			**25**	0.3	10
34 CA		20			**20**	0.3	40
35 CSC		20			**20**	0.1	60
Total Vendors	**598**	**1,275**	**452**	**1,410**	**3,735**		
Total Market	880	1,990	2,130	2,330	**7,330**		
Representation	68%	63%	21%	61%	**51%**		

- Acquisition of services companies presents significant difficulties because the assets of the acquired company can walk out and leave an empty shell. Hostile acquisition of a services company is a fruitless exercise.

- A number of equipment vendors that would qualify in this ranking principally by virtue of their maintenance revenues have been excluded because their other service revenues are small (less than 20 million dollars has been used as a cutoff). Excluded vendors are listed below with their revenues in $ U.S.

Company Name	Equipment Maintenance	Management Revenues	Planning & Devt.
Hewlett-Packard	120	8	5
NCR	90	9	10
Nixdorf	30	2	1
Philips	30	2	2
Rank Xerox	30	2	0
Wang	160	14	5

M

Planning Revenues—United Kingdom

- Planning of systems represents a key battleground between consultancies moving into software development and the software development companies. Strategic consultancy is a key skill since it determines or influences all other buying decisions.

- Equipment vendors are also aware of the importance of this trend and are trying to develop industry specialist knowledge in order to position themselves as consultants.

- A number of total solutions companies are beginning to emerge—that is, companies that can provide the planning, the development, the management and operations, and also the maintenance. These companies are by no means in any position to offer total solutions across the whole of Western Europe.

- Possible candidates as total solutions companies in the United Kingdom are:
  - IBM
  - ICL
  - Andersen Consulting
  - EDS

EXHIBIT I-13

United Kingdom

Planning Revenues 1988 ($ Millions)						
	Total Serv. Rank	Company	Rev.	Share (%)	Contribution to Service Rev. (%)	Contribution to Total Rev. (%)
1	19	P-E	60	6.8	86	81
2	15	C & L	55	6.3	69	28
3	17	Price Waterhouse	55	6.3	73	26
4	18	Ernst & Young	55	6.3	79	20
5	21	KPMG	55	6.3	85	19
6	10	Andersen	50	5.7	50	33
7	16	PA	45	5.1	60	49
8	26	Deloitte	35	4.0	88	20
9	27	McKinsey	35	4.0	100	82
10	28	Touche Ross	30	3.4	86	27
11	5	Sema Group	25	2.8	16	12
12	31	Bain	25	2.8	100	73
13	8	SD-Scicon	15	1.7	14	11
14	1	IBM	10	1.1	2	0
15	2	ICL	10	1.1	2	1
16	11	Logica	10	1.1	13	11
17	3	Digital	5	0.6	2	0
18	4	Unisys	5	0.6	3	1
19	7	Hoskyns	5	0.6	5	3
20	9	Bull	5	0.6	5	1
21	12	Olivetti	5	0.6	6	1
22	30	F Group	3	0.3	11	11
	Rest of Market		598	32.0		
	Total Market		880	100.0		

- Alternatively, many alliances are developing between the three different types of company:
  - The equipment vendors
  - The consultancies
  - The software developers

Alliances are especially prevalent in systems integration.

- Some equipment vendors, although extending their software activities, are concentrating on products without developing services capabilities. The most significant of these companies is Hewlett-Packard.

N

Development Revenues—United Kingdom

- Of the 32 companies shown as the top software developers in the United Kingdom, 7 are equipment vendors, 9 are consultants, 14 are software developers, 1 is a software products company, and 1 is a contract agency.
- Research has shown that quality is becoming the key issue in winning and keeping clients, and that at last some companies are making extensive efforts to introduce Total Quality Management and zero defects.
- Part of the reason for interest in systems integration from the end-user point of view is the attraction of fixed-price contracts.
- Part of the reason for interest in systems integration from the vendor point of view, apart from profitability, is image—i.e., to show that the company is important. Image is especially important in those countries that have a very fragmented vendor base, such as West Germany.
- As more industry markets become gradually pan-European as a result of the 1992 initiative, the implication is that there could be a move away from custom software development towards software products.
- As software product companies move into services in order to increase revenues, software developers are trying to reuse their software and develop software products because of the significant productivity gains. It can be difficult for services companies to adjust to the needs of marketing and supporting products—and vice versa for products companies. These difficulties are adding to the problems of the end user because the product/service is oversold and "total solutions" turn out to be partial, as before.

EXHIBIT I-14

United Kingdom

Development Revenues 1988				$ Millions		
	Total Serv. Rank	Company	Rev.	Share (%)	Contribution to Service Rev. (%)	Contribution to Total Rev. (%)
1	1	IBM	140	7.0	22	2
2	5	SEMA	120	6.1	78	59
3	2	ICL	110	5.6	22	7
4	8	SD-Scicon	90	4.5	82	68
5	11	Logica	80	4.0	88	79
6	22	Data Logic	60	3.0	100	75
7	14	Thorn	50	2.5	59	5
8	10	Andersen	45	2.3	45	29
9	13	Istel	45	2.3	53	34
10	24	Computer People	45	2.3	100	100
11	3	Digital	40	2.0	14	3
12	4	Unisys	40	2.0	21	7
13	25	CMG	40	2.0	95	61
14	7	Hoskyns	35	1.8	32	19
15	16	PA	30	1.5	40	33
16	29	BIS	30	1.5	100	40
17	15	C & L	25	1.3	31	13
18	20	Centre-File	25	1.3	38	25
19	30	F Group	25	1.3	89	89
20	32	McDonnell Douglas	25	1.3	100	10
21	9	Bull	20	1.0	19	5
22	12	Olivetti	20	1.0	22	5
23	17	Price Waterhouse	20	1.0	27	9
24	23	EDS	20	1.0	40	37
25	33	CA	20	1.0	100	40
26	34	CSC	20	1.0	100	60
27	18	Ernst & Young	15	0.8	21	6
28	6	Prime	10	0.5	8	3
29	19	P-E	10	0.5	14	14
30	21	KPMG	10	0.5	15	3
31	26	Deloitte	5	0.3	13	3
32	28	Touche Ross	5	0.3	14	4
	Rest of Market		705	35.6		
	Total Market		1,980	100.0		

O

Management and Operations Revenues—United Kingdom

- This is the most fragmented of the four markets (planning, development, and maintenance being the others) that have been examined in this report. Companies competing in this market have very diverse backgrounds. Of the 17 shown in the exhibit, 7 are equipment companies, 4 are processing companies, 1 is a Big 6 consultancy, 4 are software developers, and 1 is a third-party maintenance company.

- There is a great deal of debate and interest in the United States on what is referred to as outsourcing. The situation in Europe varies widely across national boundaries; in the less-developed countries, ownership of a data centre is still an important status symbol for a company.

- The importance of processing varies across Europe also. In Scandinavian countries, processing services have not experienced the same decline as the computer bureaus in the rest of Europe. Processing services have declined from 50% to 15% of the total software and services market in Europe in the last ten years; however, in Scandinavia processing represents 30% of the market, and in the U.K., only 10%.

- The United Kingdom has the largest facilities management market in Europe, slightly ahead of France, but the United Kingdom has the most developed facilities management market since it accounts for 15% of all processing, which is the highest proportion in Europe. The clear market leader in the U.K. is Hoskyns.

- A few companies in the United Kingdom have had successful processing businesses, and the reason for their success has been specialisation. Companies that have identified a niche application, and concentrated in that niche, have grown successfully. These niches can be vertical niches, such as transaction processing for the commodity markets, or they can be horizontal, such as payroll.

- It is likely that this market as a whole will develop specialisations. The importance of knowing the clients' businesses in order to provide credible problem removal, or alternatively to be at the leading technological edge, will mean that—as has happened in the planning and development part of the market—successful strategies will be either to offer a wide service in a specific industry market or to offer a specialised technical skill, such as network management, across industries.

EXHIBIT I-15

United Kingdom

Management and Operations Revenues 1988 ($ Millions)						
	Total Serv. Rank	Company	Rev.	Share (%)	Contribution to Service Rev. (%)	Contribution to Total Rev. (%)
1	1	IBM	70	3.3	11	1
2	7	Hoskyns	70	3.3	64	39
3	2	ICL	50	2.3	10	3
4	3	Digital	40	1.9	14	3
5	13	Istel	40	1.9	47	31
6	20	Centre-File	40	1.9	62	39
7	14	Thorn	35	1.6	41	3
8	23	EDS	30	1.4	60	55
9	4	Unisys	20	0.9	10	3
10	6	Prime	20	0.9	17	5
11	5	Granada	10	0.5	9	1
12	5	Sema	9	0.4	6	4
13	8	SD-Scicon	5	0.2	5	4
14	10	Andersen	5	0.2	5	3
15	12	Olivetti	4	0.2	4	1
16	9	Bull	2	0.1	2	0
17	25	CMG	2	0.1	5	3
	Rest of Market		1,688	78.8		
	Total Market		2,140	100.0		

P

Maintenance Revenues—United Kingdom

- The stagnation of the equipment maintenance market is leading to a move by equipment maintenance companies to do two things—to maintain a greater variety of equipment and to offer more related services.

- Recent research shows that about two-thirds of third-party maintenance companies offer support on system software and one-third offer support on applications software.

- Maintenance companies are also moving into the management and operations sector and are offering such services as:

- Disaster Recovery Services
- Software Evaluation
- Capacity Planning
- Cabling
- Configuration Planning
- Network Planning
- Network Management
- Environmental Planning

• Three-quarters of third-party maintenance companies offer some kind of consultancy.

EXHIBIT I-16

United Kingdom

Maintenance Revenues 1988 ($ Millions)

	Total Serv. Rank	Company	Rev.	Share (%)	Contribution to Service Rev. (%)	Contribution to Total Rev. (%)
1	1	IBM	430	17.7	66	7
2	2	ICL	320	13.2	65	20
3	3	Digital	200	8.2	70	15
4	4	Unisys	130	5.3	67	23
5	6	Granada	100	4.1	91	9
6	6	Prime	90	3.7	75	23
7	9	Bull	80	3.3	75	19
8	12	Olivetti	66	2.5	67	15
	Rest of Market		1,014	41.7		
	Total Market		2,430	100.0		

II

Competitive Analysis

II

Competitive Analysis

A

Competitive Analysis by Vendor

See attached profiles

Rank 1.	IBM
Rank 2.	ICL
Rank 3.	Digital Equipment Company
Rank 4.	Unisys
Rank 5.	Sema Group
Rank 7.	Hoskyns Group
Rank 8.	SD-Scicon
Rank 9.	Granada
Rank 10.	Bull
Rank 11.	Andersen Consulting
Rank 12.	Logica
Rank 14.	Istel
Rank 24.	EDS
Rank 30.	Bis Group
Rank 33.	McDonnell Douglas

1. IBM

- IBM is positioning itself as a "Total Solutions Company"—that is, from strategic consultancy to operations—and is making strenuous efforts to move into software and services.

- The original strategy of making the changes internally has failed and been changed. IBM has made a number of minority share acquisitions in software companies. The full extent of these acquisitions is not really known, but it is a very clever strategy because it ties in the small companies to an IBM view of the world, and the investment is relatively cheap.

- In Europe, a great deal of IBM's minority acquisitions are taking place in Scandinavia.

- Acquisition of services companies is a dangerous strategy unless the acquisition is welcomed by the key personnel. A trend towards open systems is also a danger in that open systems make it more difficult to control retailers, who become less dependent on proprietary systems. Evidence suggests that steps have been taken by IBM to offer IBM employee benefits to the employees of IBM's value-added resellers, in order to make the resellers more dependent.

- IBM has released control of the sale of services from headquarters and has released services into the sales force.

- At one stage there was a possibility that IBM would join forces with Andersen Consulting, but it is now more likely that these two will become key competitors, as Andersen broadens its equipment range and extends its total solutions offering.

2. ICL

- ICL claims more than 40% of its revenues come from services; INPUT estimates that services contribute 31% of ICL's total revenues.

- 68% of ICL's revenues are generated in the United Kingdom.

- To concentrate on strengths, ICL has developed from covering all industry sectors to a "niche strategy". The principal strengths are local and central government and retail. More than half the new poll tax systems in England and Wales will be ICL systems.

- ICL has also entered joint ventures in order to increase its penetration in continental Europe. One of these joint ventures has created the second largest IT company in Denmark.

- STC has developed a very strong communications capability with Northern Telecom, which is the fastest growing part of STC's business and now accounts for more than 25%.

- ICL is looking to leverage its communications and industry knowledge in order to gain large systems integration contracts.

- STC has set up a new consultancy company called IT Partners, which will eventually become independent from ICL equipment, and which will complement the already existing ICL professional services organisation.

- Like other equipment manufacturers except for IBM and Digital, ICL is very strong on open systems and UNIX and is committed to UNIX International.

3. Digital Equipment Company

- Digital has in VMS the strongest proprietary system, due to its compatibility across all sizes of computer. This strength, allied with strong intermachine communications ability, has been the main reason for Digital's success. One of the key market forces driving this success has also been instrumental in driving the services market—that is, the decentralisation of the IS department and the advent of departmental computing.

- Like IBM, the only other significant proprietary systems vendor, Digital's attitude to UNIX is still ambiguous, especially since UNIX will have its impact most on the midrange, where Digital has its strength.

- Important moves made by Digital that are significant for equipment sales are emphasis on office automation and the introduction of a fault-tolerant system. The latter is expected to be targetted at IBM's domination of the finance market.

- Like other equipment manufacturers, Digital has been making alliances with services companies in order to benefit from systems integration contracts. Although it is believed that there is some effort to include services in sales targets, there is no evidence with Digital of a move into services to the same extent as with the other equipment manufacturers.

- Digital's main service strength, and the major source of its professional services revenues, is network design and management. This is a very confused and ill-defined market at the moment, and could present a major opportunity for Digital to develop the services side of the business. Networks follow the whole planning, development, management

and operations, and maintenance cycle—and as such provide an opportunity for Digital to widen its services offering by using this area of expertise as the thin end of the wedge.

- INPUT believes that in the long term Digital will have to come to terms with services as a business rather than as a means of selling equipment. As equipment and then software become progressively more like commodities, the profitability and growth potential of services will become irresistible.

4. Unisys

- Unisys is still experiencing problems as a result of a merger of two sets of incompatible equipment.

- The company did establish a very strong consumables business and has turned this business from a support function to an extensive and profitable business.

- Unisys has been one of the first equipment companies to target the systems integration market and has set up a complex systems organisation to focus on large complex systems and to obtain the profitable project management and development services that are awarded along with the equipment. The significant feature of this organisation is an emphasis on non-Unisys equipment.

- Another services effort by Unisys is environmental services. Unisys has won contracts for setting up large data centres that feature other manufacturers' equipment (e.g., Sealink's large VAX installation).

- Unisys now offers a wide range of consultancy services in planning and operations, as well as specialist areas such as expert systems.

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Chairman: B.J. Gibbens

The Company

The Sema Group resulted from a merger in 1988 of the French services company Sema Metra and the U.K.-based Cap Group Plc. Both companies had been in operation for 25 years.

Sema Group is a public company listed on the Paris Bourse and the London International Stock Exchange.

The major shareholders are:

Paribas	39.6%
Cap Gemini Sogeti	13.6%
Volmac	4.6%
Union D-Etudes et D'Investissement	4.0%
Jeumont-Schneider	2.7%
TOTAL	64.5%

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Sema Group has shareholdings in the following subsidiary/affiliate companies:

Direct Subsidiaries	Proportion Held (Percent)	Country of Registration and Operation
Baddeley Associates Ltd.	100	U.K.
Cap Industry Ltd.	100	U.K.
Cap Information Systems Pte Ltd.	100	Singapore
Data Networks Plc	100	U.K.
Sema Group SA (formerly Sema Metra SA)	98.8	France
Sema Group U.K. Ltd.	100	U.K.

Indirect Subsidiaries	Proportion Held (Percent)	Country of Registration and Operation
Cap Financial Services Ltd.	100	U.K.
Cap Scientific Ltd.	100	U.K.
Computer Projects and Programming (CPP) BV	100	Netherlands
Sema Group GmbH	90	West Germany
Sema Metra Iberica SA	93.33	Spain
Sema Metra Conseil SA	100	France
Sobemap SA	100	Belgium
Sofres SA	100	France
Sofemasa SA	93.33	Spain
SG2 Iberica SA	93.33	Spain
Uniciels SA	49	France
Yard Ltd.	100	U.K.
Yard Software Systems Ltd.	100	U.K.

Sema Group employed 6,502 people on average during 1988.

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Staff was approximately distributed as follows:

U.K.	3,100
France	2,000
Spain	750
Belgium	320
West Germany	100
North America	Small Teams
Singapore	N.A.

Key Products and Services

The four main areas of activity are described below. They account for the following proportions of the company's business:

Facilities management		5%
Market research		9%
Consultancy		12%
Software & systems		74%
• Technical software	29.6%	
• Management software	44.4%	
TOTAL		100%

1. Facilities Management

The facility management activities are carried out in the main by the subsidiary Data Networks -- major contracts include Varity Corporation, Greater Glasgow Health Board, and British Steel Service Centres.

Hardware platforms managed include:

- IBM 3090
- IBM 4361
- DEC
- ICL

2. Market Research

The market research activity in the Sema Group is carried out by Sofres in France, and subsidiaries in Spain and Belgium. Sofres utilises a panel of 20,000 households (53,000 individuals).

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The fields of market research are several, including:

- Political polling (France)
- Television ratings (France)
- Measurements of advertising impact on consumption
- Solid economic analysis trends (France, Spain)
- Business-to-business marketing (Belgium)
- Media market analysis (Belgium)

3. Consultancy

The consulting activities are spread over several areas:

- Engineering consultancy is carried out by YARD, the main core of whose business is in the Defence sector, particularly the naval sector.

- Management consultancy is carried out by Sema Group Management Consultants (SMC). The areas of activity, both in the private and public sectors are:

  - High technology -- strategic directions

  - Basic industries -- restructure and innovations

  - International trade and marketing for consumer industries

  - International development for government and public enterprises

  - Regional development agencies -- project identification and monitoring

- Information design consultancy -- through Baddeley Associates; Sema Group provides consultancy in information design with the objective of improving their customers' external and internal communications.

4. Software and Systems

The software and systems activities are divided into the following sectors:

- Financial services -- among the products and services in this area there are:

  - Card pack -- credit card processing service (12 installations in 1988 worldwide)

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- Base 24EFT POS U.K. -- communication package for transactions through EFT POS U.K.
- Branch banking software products
- Dealing room systems
- SEB 10 (electronic banking system)
- Stock exchange systems for automatic routing, transaction processing and quoting

• Industrial -- a variety of products and systems are offered in this area, such as:

- Handling and invoicing systems
- Information systems
- Data acquisition/analysis systems
- Sales control systems
- Party control systems
- Warehouse management systems

• Communications -- key products and services in this area are:

- Project planning
- Scheduling systems for communications
- Band II and TN 10 radio telephone networks
- ISDN (integrated services digital networks)

• Space and defence:

- Coordination of mission systems avionics
- Battlefield command/control and communications systems
- Simulators
- Space communications software
- Battlefield presentation display software

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- Graphic measurements processing systems
- "Concerto" software workbench for communications, space and defence industries

- Commerce:
  - "Easy" accounting software package
  - Reservation systems
  - Credit management modules
  - Sirius 4000 workstation for interactive production makeup in the publishing industry
- Government:
  - Design and implementation of data processing systems
  - Investment planning control systems
  - Expert systems
- Transport:
  - Signalling control systems
  - Human resources management systems for airlines
  - Car leasing application packages
  - Traffic control systems
- Energy:
  - Maintenance of atomic plants' control systems
  - Reconstruction of information processing equipment
  - Data processing planning for chemico-energy industries

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Financial Information

The following is a five-year summary for the Sema Group in the period 1985-1988, the year ending on 30th April.

FIVE-YEAR FINANCIAL SUMMARY, 1985-1988

	MILLION £				
	1985	1986	1987	1988	1989 9 Months Ended 31 • 12
Revenues					
• CAP	36.5	50.6	78.8	113.1	77.5
• Sema Metra	113.2	140.6	144.6	167.0	84.1
TOTAL	**149.7**	**191.2**	**223.4**	**280.1**	**161.6**
Profits					
• CAP	2.1	2.7	5.8	8.2	(4.9)
• Sema Metra	4.8	6.5	5.9	7.8	7.5
TOTAL	**6.9**	**9.2**	**11.7**	**16.0**	**2.6**

The geographic analysis of Sema Group's 1988 revenues:

U.K.	42%
France	34%
Spain	7%
Belgium	6%
Rest of Europe	5%
TOTAL EUROPE	94%
Asia	1%
North America	2%
Rest of World	3%
TOTAL WORLD	100%

The industry analysis of Sema Group activities:

Financial services	24%
Industrial	21%
Space and defence	15%
Services (commerce)	10%
Government	8%
Energy	8%
Transport	8%
Communications	6%
TOTAL	100%

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INPUT estimates that approximately $343 million of the Sema Group's revenues in calendar year 1988 were generated from within the computer software and services industry within Western Europe. The following table shows the analysis of those revenues across INPUT's market sector definitions:

INPUT MARKET SECTOR	PERCENT	$ MILLION
Processing services	6	20
Network services	-	-
Software products	7	25
Professional services	64	218
Systems integration	23	80
Turnkey systems	-	-
Customer services	-	-
TOTAL	**100**	**343**

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CEO: Geoff Unwin

The Company

Hoskyns was founded in 1964 by John (later Sir John) Hoskyns, and has been a public company quoted on the international stock exchange since December 1986. Prior to this, the U.S.-based group Martin Marietta Data Systems had owned the company. Only a minority shareholding was made available to the market.

In August 1988, Plessey made an offer to acquire the whole of the issued share capital of the company, and this offer became unconditional in September 1988. In May 1989, an active market in Hoskyns shares was reestablished with the placing of 21.5% of Plessey's shareholding on the open market.

In August 1989, Hoskyns employed 2,500 people.

Mergers and Acquisitions

In the recent past, Hoskyns took control of the following companies:

- CBT--a software house for PC-based programmes
- INSIGHT--a software house operating in the IBM mid-range market
- Elfton Control/Computer Systems--a company specialising in factory automation systems
- Programme Standard Computer Systeme und Programmentwicklungen GmbH--a software company specialising in distribution systems. Programme Standard is also a major distributor of DEC in West Germany.

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Key Products and Services

Hoskyns has three principal areas of activity:

- Systems integration
- Facilities management
- Professional services

1. Systems Integration

For Hoskyns, the term covers the design, development and implementation of computer systems, but over a much wider range of project sizes than those included in INPUT's definition. In 1988 Hoskyns derived £46 million in revenues from this sector (in excess of 40% of Hoskyns' revenues).

2. Facilities Management

Hoskyns claims market leadership in this sector in the U.K.; it generated £43 million in revenues in 1988, representing 39% of total revenues.

3. Professional Services

In this area, providing user organisations with advice, training methods and tools for information technology, Hoskyns generated revenues of £20.7 million in 1988. Hoskyns claims to have over 1,100 consultants, concentrating on strategic consultancy and technical consultancy. An Intelligent Building Service was launched in 1987. Hoskyns is strongly represented in the training sector, in terms of both classroom and CBT-based training. Other important areas are project management, where Hoskyns has the PRISM range of planning, implementation and project management methodologies, and CASE (Computer Aided Systems Engineering) tools. Hoskyns has developed this latter area from the introduction of PMW, a PC-based tool in 1984.

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Financial Information

The following is a five-year summary of Hoskyns' financial performance:

FIVE-YEAR FINANCIAL SUMMARY, 1984-1989

	£ MILLIONS (FINANCIAL YEAR END 31 OCTOBER)					
	1984	1985	1986	1987	1988	1989*
Revenues	40	56	68	79.2	110.0	87.3
Profit (before Tax)	2.8	3.5	4.5	6.5	9.51	6.71

* Half year to 30 April 1989

INPUT estimates that approximately $175 million of Hoskyns' revenues in calendar year 1988 were generated from the computer software and services market within Western Europe. The following table shows the analysis of these revenues across INPUT's market sector definitions:

INPUT MARKET SECTOR	$ MILLIONS	PERCENT
Processing services	68	39
Network services	-	-
Software products	8	4
Professional services	50	29
Systems integration	-	-
Turnkey systems	49	28
Customer services		
Other	-	-
TOTAL	**175**	**100**

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Chairman and Chief Executive: Philip Swinstead
Technical Director: G.W. Holmes
Marketing Director: I.M. Scoggins
Deputy Chief Executive: W. Wesblow

The Company

SD-Scicon was formed in 1988 by a takeover of the far larger SCICON Group, previously owned by BP, by SD (Systems Designers). SD was originally founded in 1969 and obtained flotation on the stock market in 1982. Scicon started operations in 1960 as part of CEIR (Corporation for Economic and Industrial Research)-U.S.A.

SD-Scicon is quoted on the London International Stock Exchange.

The main SD-Scicon shareholders are:

British Aerospace	23.0%
British Aerospace Pension Fund	1.9%
Morgan Grenfell Investment Management (as a discretionary fund manager)	18.1%
Prudential Corporation Plc (partly beneficial owner, partly as discretionary fund manager)	5.9%
Management (approximately)	10.0%

SD-Scicon has the following subsidiary/affiliate companies:

- SD (U.K.)
- Scicon (U.K.)
- GFI (France)
- Bull Scicon Services (France)
- SCS (Germany)
- Systems Control (U.S.)
- Warrington Finance Systems (U.S.)
- Systems Control Technology (U.S.)
- SCICON (U.S.)
- SD Software (U.S.)

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- Vehicle Test Technology Inc. (U.S.) [50% of equity]
- Secure Information Systems Ltd. (U.K.)
  - Joint venture with British Telecom [49% of equity]
- Scicon Holland
- Scicon Italy
- Scicon Belgium

SD-Scicon employed around 5,500 people at the end of 1988, excluding head office staff.

There employees were deployed geographically as follows:

U.K.	2,500
France	1,000
Germany	1,000
U.S.	1,000

Takeovers, Mergers/Sales

April 1989: Sale of artificial intelligence division to a management buy-out team

November 1988: Sale of System Control including Energy Systems Division to Combustion Engineering Inc. for $11.7 million

Key Products and Services

SD-Scicon main activities are:

- Consultancy
- Software development
- Software products
- Systems integration
- Facilities management
- Supporting services

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Financial Information

The following is a five-year summary for SD-Scicon:

FIVE-YEAR FINANCIAL SUMMARY, 1984-1989

	£ MILLIONS					
	1984	1985	1986	1987	1988	1989 6 Months
Revenue - SD-Scicon	30 120	55 145	75 163	83.64 167.36	- -	- -
TOTAL	**150**	**200**	**238**	**251.00**	***221.60**	**141.50**
Profit before tax				7.40	13.40	(1,019)

* Scicon included from 18.04.1988 (including Scicon for the full year the unaudited total was 274)

The geographic analysis of SD-Scicon's 1988 revenues is:

U.K.	36.65%
France	15.50%
West Germany	15.65%
Other European Countries	7.30%
TOTAL Europe	74.10%
U.S.	23.25%
Others	2.65%
TOTAL outside Europe	25.90%
Overall TOTAL	100.00%

Industry Analysis

Government Defence Aerospace	29%
Finance - Communications	27%
Industry	24%
Energy	12%
Others	8%
TOTAL	100%

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INPUT has estimated that SD-Scicon generated approximately $344 million of revenues in calendar year 1988 from within the computer software and services industry in Western Europe. The following table shows the analysis of those revenues across INPUT's market sector definitions:

INPUT MARKET SECTOR	$ MILLIONS	PERCENT
Processing services	31	9
Network services	25	7
Software products	49	14
Professional services	139	41
Systems integration	87	25
Turnkey systems	13	4
TOTAL	**344**	**100**

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GRANADA GROUP PLC.

36 Golden Square
London W1R 4AH
United Kingdom
Tel. No.: 071-734-8080

Chairman: Alex Bernstein
Business Services Chairman: Conor Kehoe

The Company

Granada Computer Services International Ltd is today the largest independent maintenance company in Western Europe, a company that is truly Pan-European with operations that extend to cover most of the countries in Europe. INPUT estimates that Granada's share of the Western European third-party maintenance market is 15%. The company is almost three times larger than its closest competitor.

The international headquarters of Granada are located at Wokingham in the United Kingdom, about 40 miles west of London in an area well-known for high technology adjacent to the M4 Motorway. Many major computer companies are located in this area, which is often said to be the UK equivalent of "Silicon Valley". The UK is Europe's most developed third-party maintenance market, a market that represents Granada's strongest presence having a market share estimated by INPUT at over 30% of this country's market.

Until recently Granada was unknown in the sphere of computer maintenance and has become a dominant force only in the last two years. The creation of Granada has not been the result of entrepreneurial activities or organic growth, but the result of an aggressive policy of acquisition that commenced in April 1986, based on a strategy defined by the parent company, Granada Group PLC.

Raison d'Etre

The Granada Group PLC is a long-established UK company operating within the services industry in what could broadly be described as the leisure sector. Group turnover in 1988 was £1.5 billion, which generated £143 million profit before tax. The Group has a wide range of activities, which extend from television broadcasting and programme production to motorway travellers' services to independent computer maintenance. The business structure of the Granada Group PLC is illustrated in Exhibit A, which also shows that the independent computer maintenance activities are part of the Services to Business Division.

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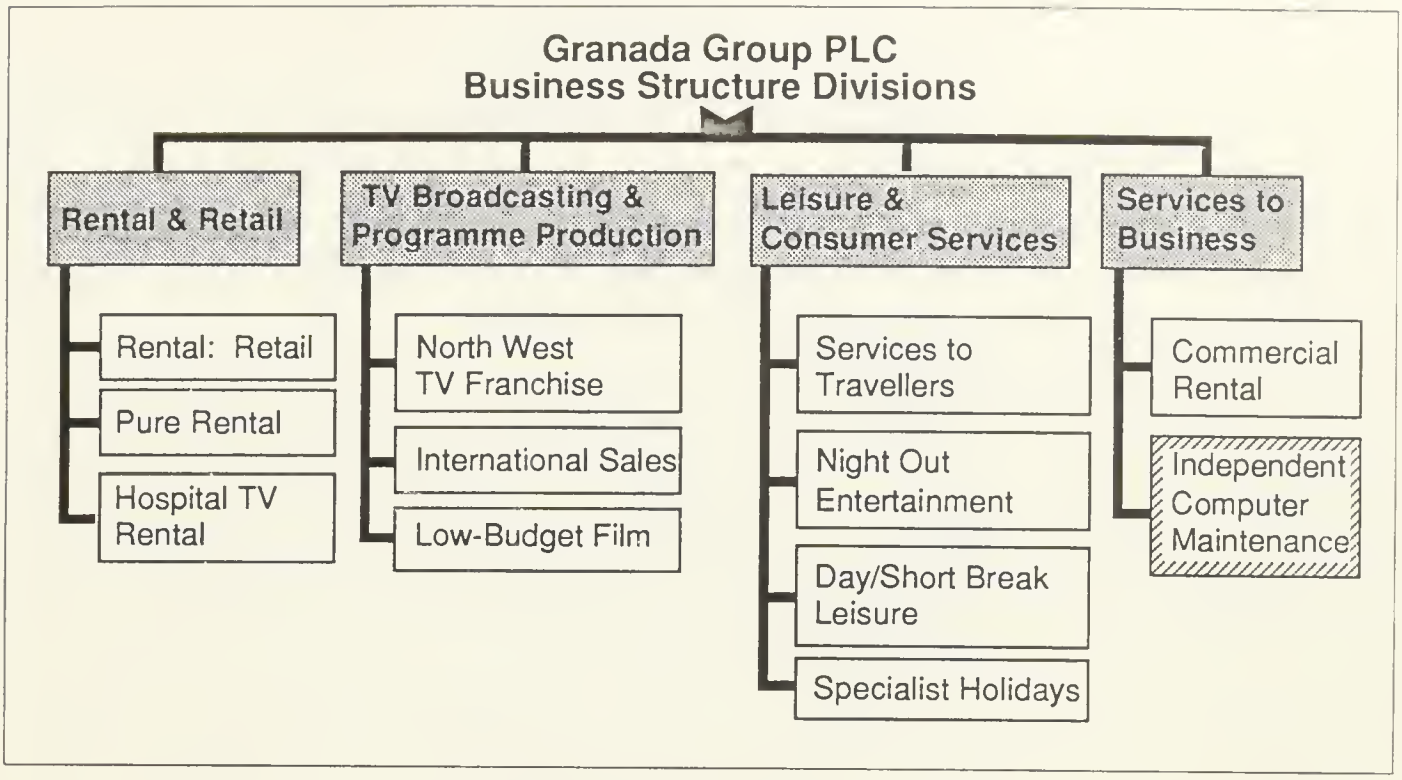

Chairman of this division is Conor Kehoe, who is also Chairman and Managing Director of Granada Computer Services International.

Entry into the independent computer maintenance market was the result of a Granada Group strategy to seek and invest in a new high-growth service industry. The Group recognised that its business was mature (highly profitable but unlikely to provide much further growth in profits) and saw a need for investment in new areas. The systematic search for a new business was based on three criteria:

- A high-growth industry with visibility and good potential for profit growth
- An opportunity to participate in an industry where the company could develop and sustain a strong leadership position. Put another way, there had to be advantages in size that could not easily be duplicated
- An industry where the company had an understanding of the management task

From these criteria it can be seen that market dominance was envisaged at an early stage, in fact was a requirement. The independent computer maintenance market fulfilled these criteria in terms of:

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- The market had potential for growth

- The market was at that time fragmented but also provided a strong case for leadership on a scale that would permit the servicing of international accounts.

- Granada had existing experience in managing service companies, particularly "on-call" repair, which provided the experience necessary to manage maintenance companies.

Granada's entry into the independent computer maintenance market resulted in a restructuring of the industry. This restructuring resulted from Granada's market leadership. Granada's strategy was the acquisition of companies that were existing market leaders in their own right, although none had achieved the degree of leadership Granada sought. The fact that a number of companies at that time were considered leaders did not diminish what Granada saw as a still-fragmented market. Granada acquired the leaders and united them to form a new leader.

What followed was a chain of acquisitions supplemented by organic growth and expansion, the highlights of which are illustrated in Exhibit B, and can be summarised as follows:

- In April 1986 Granada acquired Computer Field Maintenance (CFM), which was at that time a joint market leader in the UK.

- In August of 1986 the operations of SMS in France, Germany and the UK were acquired and in September of that year SMS operations in Spain were launched. Also in that year, in December, CFM and SMS activities in the UK were integrated.

- 1987 saw a number of smaller acquisitions and the launch of SMS operations in Belgium and Italy.

- In January 1988 Mainstay was acquired. Mainstay was a specialist GSD maintainer with activities in Belgium, The Netherlands and the UK.

- In June of 1988 Granada completed its largest acquisition by acquiring DPCE at a cost of £ 110 million. At that time DPCE was already an existing market leader with multinational operations extending to the USA.

- Following these acquisitions Granada decided that operations in Germany were still too small. Therefore in October 1988 Granada acquired WIGO, one of the largest independent maintenance companies in Germany.

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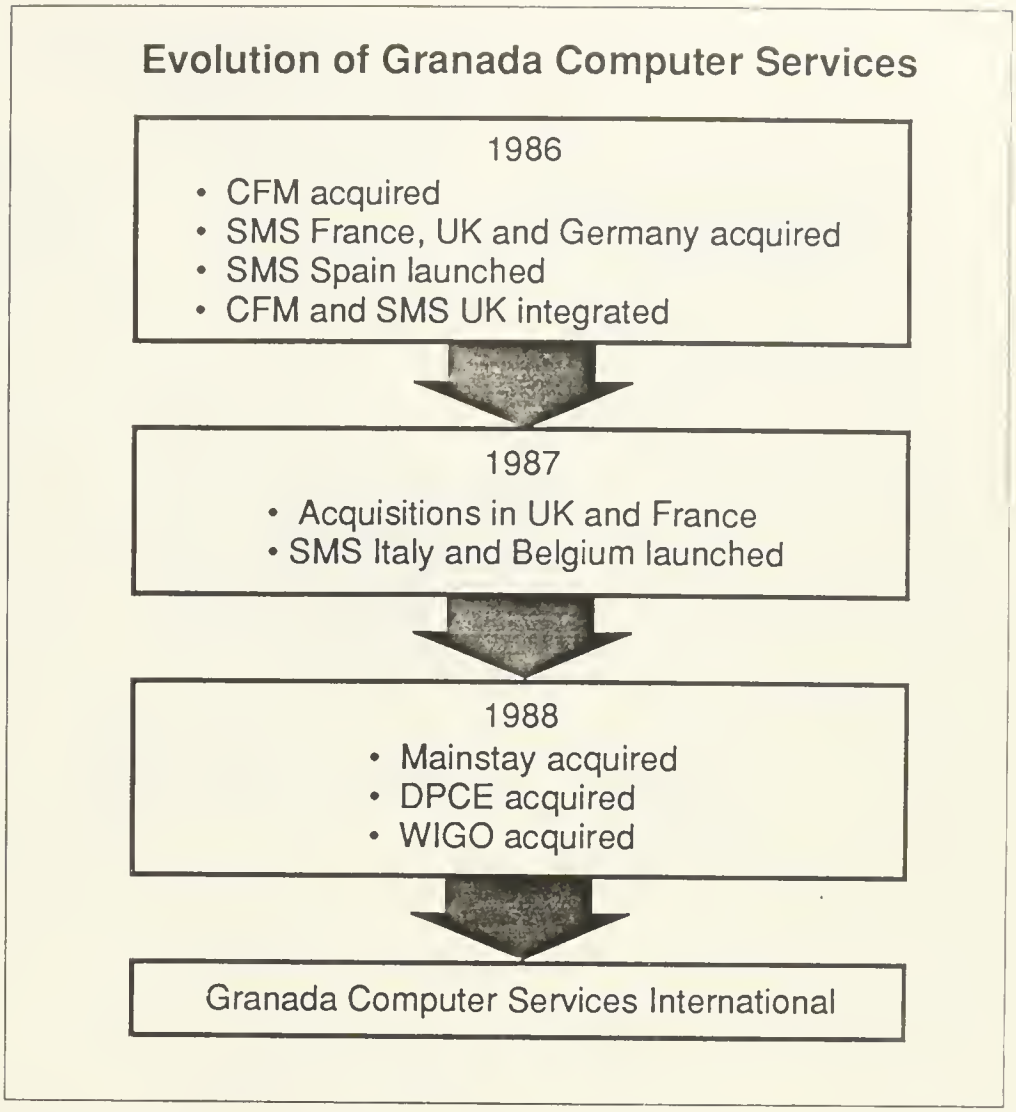

Following this chain of acquisitions of previous market leaders, Granada achieved its objectives, becoming the market leader in Europe by a large margin. Further, by achieving this level of market dominance, Granada made it difficult for its leadership position to be challenged. Another TPM company commented recently that after the string of Granada acquisitions there was very little left for any other company that might contemplate similar acquisitions.

Initially some of the businesses acquired continued to trade using their original names; however, the acquired companies now use the name Granada.

Granada Today

In achieving clear leadership within the independent computer maintenance market, Granada spent a total of £ 160 million on acquisitions. Granada now has operations in nine European countries and, through acquisition of DPCE, in Canada and the USA. The extent of Granada's current activities is highlighted in Exhibit C.

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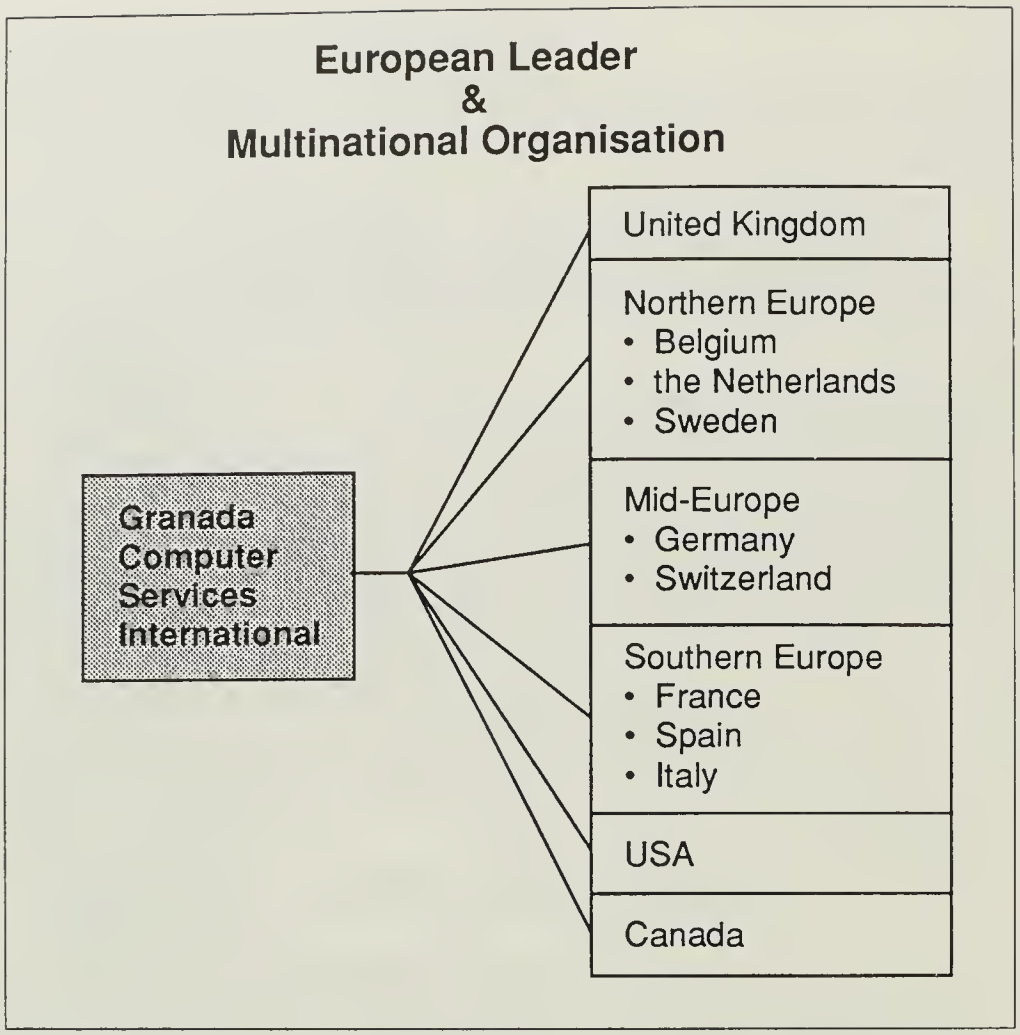

Not only is Granada the clear market leader in Europe as a whole, it is also the leader in a number of countries. This position gives the company a critical mass not previously seen in the independent maintenance market. Granada claims a number of strengths that offer advantages to existing and potential customers:

- Financial strength: the company is backed by the Granada Group, which had revenues of £ 1.5 billion and pre-tax profit of £ 143 million in 1988.

- Scale of operations: The large size allows trained engineers and spare parts to be located conveniently close to customers. Granada has over 2,000 engineers in over 100 centres and numerous customer sites. Granada also has an investment of £ 30 million in spare parts—over 150,000 parts for equipment from over 400 manufacturers. The extent of Granada's capability is illustrated in Exhibit D.

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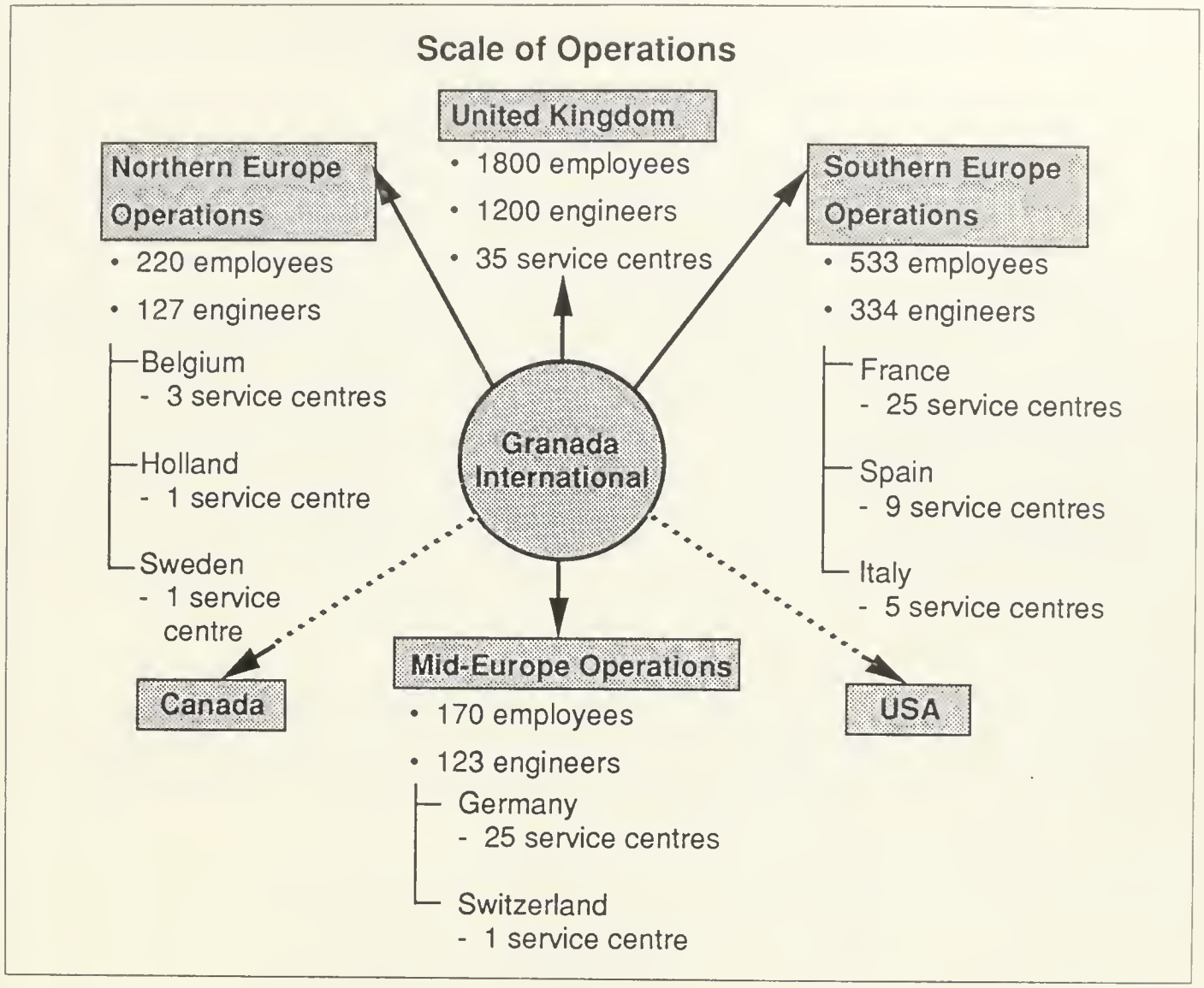

- Range of technical skills: Granada claims a depth and range of skills that are unsurpassed in Europe. The company maintains equipment from all the leading manufacturers and a wide range from the smaller manufacturers, as shown in Exhibit E. Many large customer sites are multivendor—an example quoted by Granada is British Airways, which contains equipment from IBM, NAS, Amdahl, Digital and others.

- Infrastructure investment: Included here is investment in systems that tightly monitor the movement of parts and engineers, thus ensuring high-quality service to the customer. The infrastructure also includes repair facilities (such as clean rooms) and investment in training. An example quoted is the training centre in Fenton, which has seven classrooms and is extensively equipped with sophisticated equipment for "hands-on" training, including a 3090 simulator for training on IBM 3090 computer systems. Engineers spend up to four weeks per year refreshing and supplementing skills at training centres in the UK, France, The Netherlands and Germany.

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Over 400 Manufacturers' Equipment Maintained—Including

TI	EMI	MODCOMP	COMPAREX	CIPHER	PRIME
APPLE	APOLLO	BENSON	INTAGRAPH	PLESSEY	MAXTOR
CASE	UNISYS	BASF	OLIVETTI	NOKIA	STC
BBC	CANON	COMMODORE	MITSUBISHI	PERTECH	SI
NCR	CALCOMP	TELEX	DECISION DATA	VERSATEC	RACAL MILGO
HITACHI	HEWLETT-PACKARD	FUJITSU	ERICSSON	SIEMENS	REUTERS
DATA GENERAL	CONTROL DATA	XEROX	BULL	DATA PRODUCTS	MEMOREX
IBM	NAS	AMDAHL	DEC	ICL	WANG

- Commitment to quality: the company is committed to ensuring that quality standards are established, monitored and maintained. Quality is claimed to be a priority motivation related to systems and training investment.

The strengths of Granada are summarised in Exhibit F.

The Strengths of Granada

- Financial
- International operations
- Technical Skills
- Infrastructure
- Commitment to quality

The company intends to do what is does best, for example:

- Total systems maintenance for large multivendor accounts
- High-quality, cost-effective solutions for single vendor users

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- As the industry leader, support for other industry participants, such as:
  - Offering a ready-made network for smaller OEMs, VARs and systems integrators.
  - Offering parts repair and training to smaller specialist-niche independent maintenance companies

Future Directions

For the future Granada plans to continue geographic expansion and to develop its range of related service as a complementary activity to the core business of hardware maintenance.

Geographic expansion is likely to be in two forms:

- Increased market share outside the UK to bring the rest of Europe more in line with the UK market presence
- Increased market share in the North American market, particularly to develop a larger presence in the USA

The method of achieving these continued growth patterns is not clear but, based on the process that created Granada, it would be both naive and premature at this stage to rule out further acquisitions. However, with the position of dominance already achieved, a combination of acquired and organic growth may be appropriate.

In terms of developing related services, Granada would seem well positioned because it has a presence already established in some areas. The areas covered by these related services include:

- Disaster Recovery: through a subsidiary, acquired as part of DPCE, Granada currently has a presence in this market sector: Computer Disaster Recovery (CDR) is already well established in the UK. This company has already begun a European expansion programme and offers disaster recovery services in the mobile sector of the market.
- Network Design and Installation: Granada offers a consultancy service for users designing wide-area networks (WANs) and local-area networks (LANs). This service can be supplemented with a cabling, installation and maintenance capability.
- Installation and Deinstallation: Granada provides these services for users, manufactures, brokers and lessors.
- Features and Upgrades: Granada offers a service for which the key is flexibility. Granada would source the parts required to enhance and upgrade machine performance within constraints defined by customers.

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- Brokerage: this service can take two forms. The first is a traditional brokerage service offered through DPCE products. The second is a computer exchange, which is a new computer-based information service available to users and intermediaries.

- System Software Support: Granada has an expanding operating system software service to assist users in installing software upgrades and in diagnosing problems with operating systems software.

However, one major question remains unanswered—what are Granada's next acquisition targets and in which sector of the market will they be located?

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9. Bull

- Groupe Bull is a French company with 40% of revenues generated in France.
- The company is undergoing a major strategy review, and part of that review is a move into services, although the strategy is not yet fully developed or apparent.
- The company is targeting the systems integration market, although again the strategy is not yet developed.
- A probable strategy for a company moving into services is to identify the vertical industry strengths so that expertise gained as a supplier to that industry can be leveraged into a services business. Bull is very strong in local government in France, like ICL in Europe. The result of the EEC's strategy on open procurement by national goverments will be of critical importance to these companies

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Tel. No.: +44 1 836 1200
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Managing Partner, U.K.: Don Hanson
Management Information Consulting Division: Mel Bergstein
1992 Director: Iain Stitt

The Company

Arthur Andersen entered into the information services business in 1952. It is a private partnership company.

It is divided into four main divisions:

- Accountancy and audit
- Management consultancy
- Tax consultancy
- Software products

It employs 32,000 people worldwide for all company activities, plus some 2,000 partners. The company operates in 52 countries. In Europe it employs some 8,500 professional staff, plus 400 partners. Arthur Andersen is the leading company providing audit and management consultancy in several European countries, including Italy and Spain.

Arthur Andersen established a separate company, Andersen Consulting, to handle all its information services business.

In June 1989, Andersen Consulting acquired the Norwegian software products vendor, Computer Management, which had a revenue of $5 million and 30 staff. Its main product was an IBM system software product that improves the economy of computing operations by defining the level of service and adjusting resources accordingly.

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Key Products and Services

Andersen Consulting has three principal areas of activity in the information services business:

- Systems integration
- Consultancy
- Software products and related professional services

Andersen Consulting is the largest independent commercial systems integration vendor in Western Europe. In 1988 INPUT estimated that its systems integration revenues grew from $100 million in 1987 to $155 million in 1988.

The company's consultancy services are based around five advanced systems centres. These are large IBM computer facilities. Project teams use workstations connected to these centres for the automation of bespoke applications development for each client. These professional services are estimated to have grown in 1988 from $70 million in 1987 to $105 million in 1988.

The company has targeted the manufacturing sector with its software products. These are sold independently from its consulting business. Its software products activities can be divided into two main areas:

- CASE
- Integrated manufacturing solutions

Andersen Consulting has developed a range of CASE tools. They were initially used internally by their IS consultants, then launched on the open market under the name Foundation. This range consists of:

- Method/1
- Design/1
- Install/1

Its integrated manufacturing solutions are the MAC-PAC range of products. These provide the end user with a fully integrated manufacturing, distribution and financial applications solution. Arthur Andersen is an IBM agent and works with IBM in delivering a complete package to end users.

The MAC-PAC product range consists of:

- MAC-PAC for Systems 38 and AS/400
- MAC-PAC JIT for IBM mainframes
- MAC-PAC D for IBM mainframes

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Andersen Consulting also has developed the software product DCS Logistics. Its software products revenues are estimated by INPUT to have grown in 1988 by 50%, from $10 million in 1987 to $15 million in 1988.

Andersen Consulting delivers its own application software, plus customization where needed, and associated professional services, such as training and consultancy. IBM delivers and supports the equipment, retaining it under the IBM title.

Financial Information

The following is a three-year summary of Andersen Consulting revenues in Western Europe:

THREE-YEAR FINANCIAL SUMMARY, 1986-1988

	FISCAL YEAR		
	1986	1987	1988
Total revenue ($ Millions)	100	180	280
Annual growth rates (percent)		80	56

A breakdown by country for 1988 is as follows:

	1988
U.K.	28%
France	19%
Italy	18%
West Germany	10%
Rest of Europe	25%
TOTAL	100%

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The following table shows the analysis of these revenues across INPUT's market sector definitions:

INPUT MARKET SECTOR	$ MILLIONS	PERCENT
Processing services	-	-
Network services	-	-
Software products	15	5
Professional services	105	38
Systems integration	155	55
Turnkey systems	5	2
Customer services	-	-
TOTAL	**280**	**100**

The attached INPUT Research Bulletin, produced in 1988, provides insights into Andersen Consulting's business mission.

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LOGICA plc
64 Newman Street
London W1A 4SE
United Kingdom
+ 44 - 1 - 637 9111

Philip Hughes, Chairman
David Mann, Managing Director

The Company

Logica was founded in 1969.

One of the company's founders was Philip Hughes, the present chairman.

Logica is quoted on the London Stock Exchange.

As of December 31, 1988, Logica had approximately 3,500 employees.

Key Products and Services

The business undertaken by Logica companies includes the following categories:

- The marketing, design, production and maintenance of custom-built software and associated hardware systems
- Consultancy and project management in the field of information technology
- The design, development, implementation and marketing of software products and reusable components of applications software (systems kernels)

About two-thirds of Logica's revenues come from the first category above (i.e., custom systems-software and hardware). The breakdown of Logica's 1988 activities by activity was as follows:

Custom systems	64%
- Hardware	10%
- Software	54%
Consultancy	28%
Systems kernels/products	8%

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The breakdown by market sector was:

Finance	25%
Computing and electronics	17%
Defence	10%
Post and telecommunications	10%
Energy and utilities	9%
Central and local government	8%
Manufacturing	6%
Transport	6%
Broadcasting and media	4%
Space	3%
Other	2%

The following is an analysis of Logica's 1988 revenues by client location:

U.K.	53%
Rest of Europe	26%
North America	10%
Rest of World	11%

Among Logica's software products and kernels are:

- FASTRADE: Trading information systems
- CPLEX 400: Communications software
- GALLERY 2000: Digital picture library
- MASTERCONTROL 2000: Control and data acquisition system

Financial Information

The following is a summary of Logica's financial results for the past five years:

FIVE-YEAR FINANCIAL SUMMARY, 1984-1988

	FOR YEAR ENDED 30 JUNE (£ MILLIONS)				
	1984	1985	1986	1987	1988
Revenues	50.5	62.3	87.0	110.7	132.5
Profit before tax		5.0	6.8	11.3	14.7

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Recent Developments

On 31 March 1988, Logica acquired Data Architects, Inc. in the U.S. at a cost of £25.7 million. The acquired company's activities were merged with those of Logica Systems, Inc. The combined company was renamed Logica Data Architects, Inc.

Business Strategy

The following are recent statements from Logica relating to its general aims and strategy:

"Logica was founded in 1969, and set out to establish high technical standards and achieve a prominent position in its market of high technology consultancy and services. It is a leading independent computer software, consulting and products company with an international capability and reputation."

"Wherever we work, we aim to combine this international outlook with a sensitivity for local culture. We cultivate an environment that encourages excellence and at the same time supports the individuality and creativity needed to meet the challenging requirements of our projects."

"Since its inception in 1969, Logica has consistently pursued a strategy of building an independent, international group, both by establishing its own worldwide subsidiaries and, where desirable by making acquisitions. The excellent growth of the past year, which included a substantial acquisition in the U.S. and further organic growth, is evidence of the success of this well established policy."

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ISTEL LIMITED
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John Leighfield, Chairman and Chief Executive
Chris Chiles, Managing Director

The Company

Istel started life in 1979 as **BL Systems Ltd.** It was formed to provide an organisation dedicated to the provision of computing, communications and systems services. The company was wholly owned by British Leyland (and subsequently the Rover Group).

Istel was privatised in June 1987 in a management-led employee buyout from the Rover Group. The share ownership of the company following the privatisation is as follows:

Senior management	38%
Employees	28%
Institutional investors	34%

Key Products and Services

ISTEL's two main activity areas are computer-integrated-manufacturing (CIM) and network services.

ISTEL's skills and experience in the CIM area come mainly from its association with the Rover Group companies in the past.

ISTEL operates its network services over its own nationwide communications network.

In addition, **ISTEL** provides its customers with a wide-range of products and services including industry-specific bespoke systems and packaged software, consultancy and project management, IBM mainframe bureau processing, commercial and engineering timesharing, and hot restart disaster recovery services

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The following is a breakdown of the 1987 revenues of **ISTEL** by activity; the corresponding 1983 breakdown is also given for comparison.

	1987	1983
Computer application processing	31.8%	50.0%
Systems and consultancy	40.3%	40.0%
Network services	13.4%	4.5%
General systems and software products	14.5%	1.5%

The split by type of client for 1987 was as follows:

	1987
Rover Group companies	57.2%
Manufacturing and engineering	16.0%
Distribution	6.6%
Financial services	8.1%
Leisure	3.3%
Health	2.3%
International	2.3%
Other	4.2%

By comparison, in 1983, **ISTEL** derived 89% of its revenues from the Rover Group, with the remainder coming from the manufacturing and engineering sector.

ISTEL supplies the following products as publisher:

PRODUCT	DESCRIPTION
WITNESS	Visual Interactive modelling system
VISIT	Vehicle routing and delivery scheduling system
COMET	Electronic messaging
EDICT	Electronic data interchange
PYRAMID	Manpower planning model
TRAVELBANK	Travel industry applications

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Financial Information

The following is a financial summary of ISTEL for 1983 to 1987:

FIVE-YEAR FINANCIAL SUMMARY, 1983-1987

	£ (000)				
	1983	1984	1985	1986	1987
Revenues					
- Rover Companies	29212	29742	34975	38712	40254
- Other Companies	3433	7811	14744	22052	29892
TOTAL	32645	37553	49719	60764	70146
Profit Before Tax	928	(192)	1728	2167	5018

Recent Developments and Strategy

Although ISTEL has left the Rover Group, its relationship with the company is still a close one. The Rover Group remains ISTEL's most significant customer, providing over 50% of revenues in 1987.

However, the separation has freed ISTEL to expand through acquisition. The company has already taken over some small businesses, and has plans for more.

ISTEL's focus for the future will continue to be on CIM and on communications network services, both of which the company believes have tremendous growth prospects.

In terms of industry sectors, ISTEL sees potential opportunities for the future on the retail side of financial services and in the health care field. ISTEL has already had significant success with its computerised life assurance quotation service.

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ELECTRONIC DATA SYSTEMS CORPORATION
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Managing Director, International Division: Clyde Ziegler
Director, Sales and Marketing: John Beach

The Company

Electronic Data Systems Corporation (EDS), founded in 1962, is a leading information and communications services company providing information processing, systems management and communications services internationally.

- EDS currently has more than 6,000 clients in 27 countries worldwide.
- EDS' largest client is General Motors Corporation (GM) and its subsidiaries, which contributed approximately 59% ($2.8 billion) to EDS' 1988 revenue.

EDS and its subsidiaries were acquired by GM in October 1984 for approximately $2.5 billion.

- The acquisition was consummated through an offer to exchange EDS common stock for either $44 in cash or $35.20 in cash plus two-tenths of a share of Class E common stock, plus a nontransferable contingent promissory note issued by GM.
- EDS operates as an independent subsidiary of GM. EDS' performance forms the base from which any dividend on the GM Class E common stock will be declared. These earnings include income earned from services provided to GM and its other subsidiaries.
- Through its work for GM, EDS has gained expertise in factory automation, strengthened its international presence and enhanced its communications expertise.

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The international operations of EDS were established in 1974 and are run from London. They were largely formed out of the merger of UCSL, acquired from Unilever of the U.K., and SPI, acquired from Pechniney of France.

Recent acquisitions made by EDS include the following:

- In May 1989, EDS and Hitachi Ltd. announced the completion of their acquisition of National Advanced Systems Corporation (NAS) from National Semiconductor Corporation. EDS and Hitachi have formed a new, independently operated joint venture company, Hitachi Data Systems Corp., which will market and distribute Hitachi PCM mainframe and peripheral equipment. EDS holds a 20% equity in the new venture.

- In April 1989, EDS acquired BancSystems Association Inc. (Westlake, OH), a subsidiary of Society Corporation that provides credit card transaction processing services to the financial services industry. Terms of the purchase were not disclosed.

  - BancSystems, founded in 1969 as a not-for-profit association owned by the member institutions that used its services, was acquired by Society Corporation in 1984.

  - BancSystems provides MasterCard and Visa credit and debit processing and related services to more than 180 financial institutions in Ohio and seven other states with more than 2.4 million cardholders and 38,000 merchants.

  - BancSystems had approximately 300 employees at the time of the acquisition. Its operations have been merged into EDS' Financial Industry Group.

  - EDS will continue to operate out of BancSystems' Westlake offices, where it will continue to perform credit card processing for Society Corporation's affiliate banks, other BancSystems customers and the expanded national business it expects to obtain.

- In April 1989, EDS acquired the electronic funds transfer (EFT) business of Automatic Data Processing Inc. (ADP). Terms of the acquisition were not disclosed.

  - ADP's EFT business includes a range of services for automatic teller machines and point-of-sale applications for the banking industry.

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- Headquartered in Clifton (NJ), ADP's EFT operations employ nearly 300 people and supply one of the largest networks in the industry.

- EDS' most significant acquisition during 1988 was made in April when the company acquired MTech Corp. of Dallas (TX) for approximately £347 million. The acquisition was accounted for as a purchase.

  - MTech stockholders had the option to receive $30 in cash or $13 in cash plus one-third share of GM Class E common stock with a Limited Guarantee for each share of MTech stock.

  - MTech operates the third-largest ATM network in the U.S. and handles the data processing for more than 1,100 financial customers nationwide.

  - MTech had approximately 3,300 employees at the time of the acquisition and 1987 revenue of $232.1 million. EDS expected MTech's business to generate $190 million in revenue for 1988.

  - The operations of MTech have been merged into EDS' Financial Industry Group.

- In November 1988, EDS acquired VideoStar Connections Inc., an Atlanta-based company specializing in private satellite broadcasting services and special-event videoconferencing and VideoStar's staging services subsidiary, Staging Connections. Terms of the purchase were not disclosed.

  - VideoStar operates 17 private television networks and 1,800 downlinks. The networks are ideal for businesses or institutions that need to distribute product announcements, company or industry news, policy or procedure changes, maintenance updates or other news to a widely dispersed audience. Some of its customers are Eastman Kodak, Hewlett-Packard, DEC, Xerox and Merrill Lynch.

  - VideoStar, which now operates as an independent subsidiary of EDS, complements the video production capabilities of EDS' affiliate, Automatovie Satellite Television Network Inc. VideoStar will also make it possible for EDS to offer its line of training and educational programmes now available on its international network to customers of both EDS and VideoStar.

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- In November 1988, EDS acquired the data processing operations of Texas Commerce Bancshare's 27 correspondent banks.

- In November 1988, EDS acquired the data processing operations of Cullen/Frost Bankers' 54 correspondent banks.

- In September 1988, EDS acquired a 50% interest in and assumed management control of China Management System (CMS), the largest information services company in Taiwan.

  - CMS, with 1987 revenue of $10 million, specializes in systems integration, systems development, on-line processing, packaged software and management consulting. Its customers include government agencies, financial institutions, manufacturers and trading companies.

  - The agreement enables both organisations to extend their international links as well as compete more strongly for focal information processing contracts.

- In September 1988, EDS acquired General Data Systems Ltd. (GDS) of Philadelphia. Terms of the purchase were not disclosed.

  - GDS specializes in systems and services for the property and casualty insurance industry.

  - GDS had approximately 100 employees at the time of the acquisition. Since 1983, GDS' revenues have increased annually at a compound rate of 38%.

  - The operations of GDS have been merged into EDS' Commercial Insurance Division.

In March 1989, EDS and Hewlett-Packard signed an agreement that formally establishes the framework for cooperation on systems integration projects. Under the terms of the agreement, HP and EDS will submit joint proposals to customers for the development, design, management, and support of projects requiring the integration of hardware, software, and project management services.

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EDS is currently organised into the following business units:

- The Government Systems Group
- The Financial Industry Group
- The Insurance Industry Group
- The Commercial, Communications and International Services Group

The International organisation that controls all activities outside North America is one part of this last unit and is based in London. EDS has in excess of 7,000 employees in its international organisation.

Key Products and Services

A three-year summary of source of worldwide revenue by operating group is estimated by EDS as follows:

ELECTRONIC DATA SYSTEMS CORPORATION
ESTIMATED SOURCE OF REVENUE SUMMARY

	FISCAL YEAR (PERCENT)		
ITEM	1988	1987	1986
Financial and insurance	22	18	15
Commercial, communications, and international services	17	16	13
Government systems	14	14	12
Subtotal*	53	48	40
GM	47	52	60
TOTAL	100	100	100

* These estimates include certain revenue from GM that has been reported in the Commercial, Communications, and International Services and Financial and Insurance Groups.

EDS services are offered as follows:

- Facilities Management (FM): EDS assumes virtually all of the data processing and communications requirements for the customer over a multiyear term. Responsibilities include the design and implementation of business information systems, the staffing of the data processing functions, the development and maintenance of necessary software and the operation of all computer activities.

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- Systems Integration: EDS designs, implements and installs the appropriate combination of hardware and software integrated into a total system designed to fulfill the customer's processing and communications requirements.

- Fiscal Agent: EDS is responsible for all data processing functions as well as other administrative duties. These may include processing and paying claims as well as ensuring proper coordination of benefits.

- Professional Services: EDS provides system design, custom/contract programming, consulting, engineering services, education and training.

- Processing Services: EDS provides data processing services from an EDS data centre billed on a predetermined minimum monthly basis, usually based on the number of transactions.

- Some examples of international contracts awarded include the following:

  - During the first quarter of 1989, EDS signed a three-and-one-half-year agreement with BASF (a West German chemical company) to provide an information technology infrastructure for the chemical company's storage and packaging department.

  - In Spain, EDS will develop and implement an automatic warehouse system for Danone, a large producer of dairy products.

  - Under contract with DANZAS-SATEM (France), EDS will operate and maintain the company's distribution systems.

  - EDS' seven-year contract extension with French manufacturer Gallay provides for administrative systems and manufacturing applications services.

  - Also during the quarter, EDS negotiated a 10-year contract with the International Bank of Asia (Hong Kong) to assume responsibility for its information technology systems.

  - In December 1988, EDS of Canada Ltd. received a five-year contract to provide complete processing services for CAMI Automotive Inc., a joint venture between GM of Canada and Suzuki.

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- In February 1988, EDS was awarded a seven-year agreement with the United Kingdom Civil Aviation Authority (CAA) to manage the CAA's administrative computer systems and headquarters data centre. EDS is also participating in the development of improved communications between CAA's departments. The operation of 60 offices will be linked through minicomputer installations, which are to be integrated with a headquarters administrative system.

- During 1988, EDS and Shearson Lehman Hutton finalised a five-year agreement for EDS to implement an extended application of TradePro for Shearson's international operations. This is in addition to EDS' work in support of Shearson's U.K. securities trading in capital markets and international equities.

- EDS will assist France Telecom in the implementation of telecommunications capabilities that will allow France Telecom to provide integrated voice and data services to its customer.

- During 1988, EDS won a contract extension with Unilever, the Anglo/Dutch consumer products company, to provide FM and systems integration services for ten Unilever operating companies.

- EDS signed a five-year contract with Sociaal Fonds Bouwijverheid, the social security administration for the Dutch construction industry, to install and operate a pension fund system.

- EDS finalised an eight-year contract with Netherlands shipbuilder Verolme Scheepswarf Heusden BV to develop and manage new financial and reporting, personnel, time registration and production systems.

- EDS currently has more than 250 international contracts with clients in various industries.

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Financial Information

On a worldwide basis, EDS' total 1988 revenue reached $4.8 billion, a 9% increase over 1987 revenue of $4.4 billion. Net income rose 19%, from $323 million in 1987 to #384 million in 1988. A five-year financial summary follows:

ELECTRONIC DATA SYSTEMS CORPORATION
FIVE-YEAR FINANCIAL SUMMARY
($ millions, except per share data)

	FISCAL YEAR				
ITEM	1988	1987	1986	1985	1984
Revenue	$4,844.1	$4,427.7	$4,366.0	$3,443.3	$947.5
• Percent increase from previous year	9	1	27	264	295
Income before taxes	$589.4	$524.3	$464.0	$362.1	$138.7
• Percent increase from previous year	12	13	28	161	19
Net income	$384.1	$323.1	$260.9	$189.8	$80.7
• Percent increase from previous year	19	24	37	135	24
Earning per share	$3.15	$2.65	$2.13	$1.57	$0.67
• Percent increase from previous year	19	24	36	134	24

A further breakdown of 1988, 1987, and 1986 revenue follows ($ millions):

	FISCAL YEAR ($ MILLIONS)		
REVENUE SOURCE	1988	1987	1986
System and contracts			
• Outside customers	1,907.6	1,444.8	1,127.7
• GM and subsidiaries	2,837.0	2,883.3	3,195.1
	4,744.6	4,328.1	4,322.8
Interest and other	99.5	99.6	43.2
TOTAL	4,844.1	4,427.7	4,366.0

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Revenue for the 3 months ending March 31, 1989 reached $1.29 billion, an increase of $165.8 million (15%) over revenue of $1.12 billion for the same period in 1988. Net income for the period rose $10.9 million (12%) from $89.1 million to $100.0 million.

Approximately 59% ($2.8 billion) of EDS' total 1988 revenue was derived from its parent company, GM, and 2% was derived from interest and other. The remaining 39% ($1.9 billion) of total revenue was derived from clients in various industries, including banking and finance, insurance, manufacturing, retail, distribution, transportation and energy. INPUT estimates that approximately 10% ($190 million) of this was generated from international sources of which $175 million was from within Western Europe.

INPUT's analysis of EDS' non-GM revenues in 1988 in Western Europe is as follows:

Geographic Markets:

France	29%
West Germany	9%
U.K.	31%
Italy	6%
Netherlands	14%
Belgium	3%
Spain	6%
Sweden	1%
Norway	1%

INPUT Market Sectors:

INPUT MARKET SECTOR	$ MILLIONS	PERCENT
Processing services	93	53
Network services	6	3
Software products	10	6
Professional services	47	27
Systems integration	19	11
Turnkey systems	-	-
Customer services	-	-
TOTAL	175	100

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THE BIS GROUP
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Roger Graham, Chairman and Managing Director

The Company

The Business Intelligence Services (BIS) Group was founded in 1964.

It was acquired by the U.S. owned telecommunications company NYNEX (1987 revenues $12.1 billion) in February 1987.

The Group is split into four divisions, they are:

- Banking Systems
- Direct Marketing
- Information Systems
- Marketing Information

As of December 31, 1988, BIS had approximately 1,600 employees.

Products and Services

The BIS Group supplies application software systems to the international banking, insurance and investment management industries. Such systems incorporate consultancy, installation, maintenance, training and development services.

The company offers information systems management consultancy to give direction, support and formal techniques to enable companies to plan and control the evaluation, development and implementation of information systems. It also supplies security systems.

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BIS Group products include:

- **BIS Midas**, an international banking system installed in more than 500 sites worldwide.
- **BIS Folio**, a general insurance system
- **BIS Fundmaster**, an investment management system
- **BIS/IPSE**, automated systems development package

BIS's revenues in 1987 were distributed between its four divisions as follows:

Banking Systems	45%
Information Systems	27%
Direct Marketing	21%
Marketing Information	7%

The apportionment by industry sector was:

Banking, Finance	70%
Manufacturing, Processing, Electronics	12%
Government, Utilities	7%
Distribution, Services	6%
Miscellaneous	4%

BIS operates worldwide. In addition to the U.K., the company has offices in France, West Germany, Luxembourg, Ireland, North America, the Far East and Australia.

The split of BIS's 1987 revenues by geographic region was as follows:

U.K.	57%
Rest of Europe	16%
Americas	10%
South-East Asia	9%
Australasia	7%
Africa	1%

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Financial Information

The following is a summary of BIS's financial results and employee numbers for the past four years.

BIS REVENUE RESULTS AND EMPLOYEE NUMBERS

ITEM	1984	1985	1986	1987
Revenues (£ Millions)	36.5	40.4	56.2	68.1
Operating company profit (£ Millions)	2.7	4.1	6.9	8.9
Employees	956	1035	1236	1450

BIS Strategy

The following are the stated goals of the BIS Group:

- To be a leader in the information industry, including computing, telecommunications and marketing services
- To work in long-term partnership with major organisations worldwide to assist them to achieve profitable growth and increased productivity
- To be known as a company that provides innovative solutions based on quality products and services
- To operate profitably to secure the future for clients and staff

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President: Jeremy Causley
Director of Marketing: Brian Richardson

The Company

McDonnell Douglas Information Systems (MDISI) is a wholly-owned subsidiary of McDonnell Douglas Corporation of the U.S. MDISI represents some 9% of the revenue of its parent, $1.3 billion, out of a total of $15.1 billion for 1988.

MDISI is established in the U.K., and employs some 2,000 staff. It was created by McDonnell Douglas Corporation in April 1984 out of three key elements--Microdata, McAuto and TYMNET.

In the 1970s, the Computer Machinery Company of the U.K. was bought by Microdata Corporation of the U.S. This hardware manufacturing operation was then bought by McDonnell Douglas in the late 1970s. In the 1960s, McDonnell Douglas had created McAuto Corporation to support all its internal EDP requirements. In March 1984, McDonnell Douglas bought Tymshare Inc. the operator of TYMNET.

The 1980s has seen an aggressive policy of acquisition by McDonnell Douglas. In late 1983, the management committed the corporation to a policy of major growth in the information services industry:

- January 1984--purchase of Computer Sharing Services Inc. for $69.2 million. CSS provided processing services primarily for the telecommunications industry, with 1983 revenues of $27 million.

- March 1984--finalized purchase of Tymshare for $312.7 million. Tymshare operated TYMNET and provided network and processing services. 1983 revenues were approximately $297 million.

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- January 1985--announcement of purchase of the U.K. subsidiary of Tymshare Inc. from Unilever, Tymshare U.K. Terms were not announced.

- December 1984--acquired Science Dynamics Corporation of the U.S. SDC provided processing services and turnkey systems in healthcare. Terms were not announced. SDC's 1983 revenue was approximately $18 million.

- April 1985--acquired Applied Research Cambridge Ltd. of the U.K. for approximately $12.5 million. ARC specialized in CAD systems, with 1984 revenues of some $12 million.

- April 1987--acquired Isis Computer Services of the U.K. for £3.3 million. Isis specialized in PICK software and applications for payroll, personnel, police and local government on McDonnell Douglas hardware.

- February 1988--acquired Pro Computer Sciences of the U.S. Terms were not announced. Pro had developed Pro-IV, a 3GL applications generator, which was sold through Prolab of the U.K.

- 1988--reported to have acquired Northgate Computer Services. Terms were not announced. Northgate specialized in PICK systems for city and central government.

In 1988, there were signs of MDISI cutting back on its North American operations. It sold Vitek, one of its three North American healthcare businesses. It announced that it would probably sell its Health Systems Company in 1989, and it sold its cheque verification business, TeleCheck.

In late 1986, MDISI and British Telecom of the U.K. tried a joint venture on EDI, but this was abandoned by both firms. Then in August 1989, MDISI announced the sale of the North American side of TYMNET to BT for $355 million. The turnover of the North American TYMNET operations were about $250 million. It is rumoured that BT may use the international side of TYMNET that remains with MDISI for its international network services.

It also announced that it would move the headquarters of MDISI from the U.S. to the U.K. Jeremy Causley, President of MDISI, is still located in the U.S. and will soon be moving to the U.K.

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Key Products and Services

MDISI is split into four business units, reflecting its products and services:

- Computer systems and networking
- Systems integration--CAD/CAM and professional services
- Finance
- Health

The computer systems and networking consists of the U.S. and U.K. manufacturing operations, plus TYMNET. However, in 1988 the company discontinued direct sales of computer systems in North America. The other three business units deliver turnkey systems, plus associated professional services. They also provide IBM consultancy.

TYMNET offers a range of managed data network services outside of the U.S., such as E-mail, On Tyme, and database services. Its EDI service, EDI*Net has been confined to North America. It is linked into TransPac via an X.75 gateway.

MDISI's major CAD/CAM/CAE system is UNIGRAPHICS. It is sold to manufacturing and engineering sites, such as aerospace and automotive manufacturers. CAD/CAM systems are very important to MDISI, representing some 40% of its revenue.

MDISI has targeted the City of London via its Financial Unit. It did not enter the market until after Big Bang. It then identified strategic development areas. It has developed its Fund Management Investment System in conjunction with CIN Management, the manager of British Coal's pension fund, and Northgate Computer Services, which it subsequently bought as reported above. It has also signed a marketing agreement with Save & Prosper, the U.K. financial institution to sell its in-house unit trust investment administration system.

Various services are offered to local governments, such as road mapping systems and housing benefit systems. It has sold training systems, casualty recording and identification systems to the police, and the NHS in the U.K. is a major customer.

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Financial Information

The following is a five-year summary of MDISI's financial position:

FIVE-YEAR FINANCIAL SUMMARY, 1984-1988

	FISCAL YEAR ($ MILLIONS)				
	1984	1985	1986	1987	1988
Revenue	880	1,150	1,190	1,237	1,289
Annual growth rates (percent)		31	3	4	4
Operating profit/(loss)	(48)	(108)	(60)	(42)	(76)

A breakdown by country for worldwide 1988 revenue is as follows:

	1988	PERCENT	
COUNTRY	$ MILLIONS	EUROPE	WORLDWIDE
U.K.	248	66	
France	42	11	
W. Germany	50	14	
Benelux	20	5	
Rest of Europe	14	4	
Total Europe	**374**	**100**	29
Other Non-U.S.	64		5
U.S.	850		66
WORLDWIDE	**1,288**		**100**

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INPUT estimates that approximately $355 million of MDISI's revenues in calendar year 1988 were generated from the computer software and services market within Western Europe. The following table shows the analysis of these revenues across INPUT's market sector definitions:

INPUT MARKET SECTOR	$ MILLIONS	PERCENT
Processing services	-	-
Network services	6	2
Software products	29	8
Professional services	40	11
Systems integration	-	-
Turnkey systems	280	79
Customer services	-	-
TOTAL	**355**	**100**

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